


**PATENT COOPERATION TREATY**  
**PCT**  
**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**  
(Chapter II of the Patent Cooperation Treaty)  
(PCT Article 36 and Rule 70)

|  |   |   |                      |
|--|---|---|----------------------|
| Applicant's or agent's file reference<br>03002-00  | <b>FOR FURTHER ACTION</b>   |   | See Form PCT/PEA/416 |
| International application No.<br>PCT/US2004/006961   | International filing date ( <i>day/month/year</i> )<br>08.03.2004 | Priority date ( <i>day/month/year</i> )<br>31.03.2003                         |                      |
| International Patent Classification (IPC) or national classification and IPC<br>C07F9/40, C07F9/54, C07C305/06   |   |   |                      |
| Applicant<br>CYTEC CANADA INC.   |   |   |                      |
| <p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p style="margin-left: 20px;">a. <input checked="" type="checkbox"/> <i>sent to the applicant and to the International Bureau</i> a total of 2 sheets, as follows:</p> <p style="margin-left: 40px;"><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p style="margin-left: 40px;"><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p style="margin-left: 20px;">b. <input type="checkbox"/> <i>(sent to the International Bureau only)</i> a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> |   |   |                      |
| <p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input checked="" type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>  |   |   |                      |
| Date of submission of the demand<br><br>05.10.2004   |   | Date of completion of this report<br><br>18.08.2005                           |                      |
| Name and mailing address of the international preliminary examining authority:<br> European Patent Office<br>D-80298 Munich<br>Tel. +49 89 2399 - 0 Tx: 523656 epmu d<br>Fax: +49 89 2399 - 4465  |   | Authorized Officer<br><br>Kyriakakou, G<br><br>Telephone No. +49 89 2399-7835 |                      |



**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/US2004/006961

**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements**\* of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

**Description, Pages**

1-18 as originally filed

**Claims, Numbers**

1-40 as originally filed

41-54 received on 31.01.2005 with letter of 27.01.2005

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/US2004/006961

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

|                               |             |      |
|-------------------------------|-------------|------|
| Novelty (N)                   | Yes: Claims | 1-54 |
|                               | No: Claims  |      |
| Inventive step (IS)           | Yes: Claims | 1-54 |
|                               | No: Claims  |      |
| Industrial applicability (IA) | Yes: Claims | 1-54 |
|                               | No: Claims  |      |

2. Citations and explanations (Rule 70.7):

**see separate sheet**

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**Box No. VI Certain documents cited**

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1. Certain published documents (Rule 70.10)

and /or

2. Non-written disclosures (Rule 70.9)

**see separate sheet**

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Reference is made to the following document/s/:

D1: WO-A-02079212

D2: WO-A-0187900

D3: WO-A-03020843

D4: EP-A-895997

D5: EP-A-675130

D6: Journal of Polymer Science:Part:Polymer Chemistry, Vol.31,1441 (1993)

**2. Novelty (Art.33(2)PCT)**

The subject matter of the claims 1-54 on file relates to a process for the preparation of a phosphonium salt by reacting a **primary or a secondary phosphine** with a phosphate or sulfate ester and the corresponding phosphonium salts. The prior art document D2 discloses the same process for the preparation of a phosphonium salt by reacting a **tertiary phosphine** with an anion. The prior art document D1 discloses phosphinate compounds and the prior art document D2 phosphonium tosylates. D4 and D5 disclose the preparation of phosphonium salts by reacting triarylphosphin with an alkanol (D4) or an alkyl chloride (D5).

The subject matter of the present claims 1-54 can therefore be considered to be novel.

**3. Inventive Step (Art.33(3)PCT)**

3.1 The object of the present application is to provide phosphonium salts and a method of their preparation

3.2 The prior art document D2 which discloses structurally close phosphonium salts and their preparation and having the same properties is considered to represent the closest state of the art. D2 discloses the preparation of phosphonium tosylates that have been prepared by using a tertiary phosphine as starting material. D2 does not teach or suggest that primary or secondary phosphines can be used for the preparation of phosphonium salts. An inventive step can therefore be acknowledged for the present claims 1-54 on file.

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.

PCT/US2004/006961

**Re Item VI**

**Certain documents cited**

Certain published documents

| Application No<br>Patent No | Publication date<br>(day/month/year) | Filing date<br>(day/month/year) | Priority date (valid claim)<br>(day/month/year) |
|-----------------------------|--------------------------------------|---------------------------------|---|
| WO-A-2004016631             | 26. 02. 2004                         | 08.08.2003                      | 16.08.2002                                      |

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41. The compound of claim 40, wherein three of  $R^0$ ,  $R^x$ ,  $R^y$ , and  $R^z$  are methyl.

42. The compound of claim 40 or 41, wherein the unbranched chain has 12 to 20 carbon atoms.

5 43. The compound of any one of claims 30 to 39, wherein  $R^0$ ,  $R^x$ ,  $R^y$  and  $R^z$  are not identical.

44. The compound of claim 43, wherein at least one of  $R^0$ ,  $R^x$ ,  $R^y$  and  $R^z$  has 14 to 20 carbon atoms.

45. The compound of claim 30, wherein all of  $R^0$ ,  $R^x$ ,  $R^y$  and  $R^z$  are methyl.  
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46. The compound of any one of claims 30 to 45, wherein  $X^-$  is a phosphonate anion.

47. The compound of any one of claims 30 to 45, wherein  $X^-$  is a sulfate anion.

15 48. The compound of claim 47, wherein the sulfate anion is methylsulfate.

49. The compound of any one of claims 30 to 48, wherein the compound has a total number of carbon atoms between 20 and 50.

20 50. The compound of claim 49, wherein the compound has a total number of carbon atoms between 25 and 50.

51. The compound of any one of claims 30 to 50, wherein the compound is immiscible with water.

52. Use of the compound of any one of claims 30 to 51  
25 as a solvent.

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53. Use of the compound of any one of claims 40 to 42  
as a surfactant.

54. Use of the compound of any one of claims 40 to 42  
as an antimicrobial agent.

TOTAL P.06